

REMARKS ARGUMENTS

This is a Response to the Office Action mailed January 16, 2003, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire April 16, 2003. Thirty-three (33) claims, including four (4) independent claims, were paid for in the application. Claims 27 and 31 have been amended. No new matter has been added to the application. No fee for additional claims is due by way of this Amendment. The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 1-33 are pending.

Objections

Applicants acknowledge Examiner's indication that the drawings are informal and will provide formal drawings on allowance.

Claims 27 and 31 were objected to because of informalities which are corrected by the amendments above.

35 U.S.C. §102(b) Rejections

Claims 1, 14, 27 and 31 were rejected under 35 U.S.C. §102(b) as being anticipated by Joseph et al. (U.S. Patent No. 5,710,417).

The disclosed embodiment of the invention will now be discussed in comparison to the applied reference. Of course, the discussion of the disclosed embodiment, and the discussion of the differences between the disclosed embodiment and the subject matter described in the applied reference, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner to appreciate important claim distinctions discussed thereafter.

As discussed in the specification, disclosed embodiments are directed to a barcode reader that employs different height pixels to improve barcode reading. A pixel (*i.e.*, picture element) refers to the smallest unit of resolution or independently addressable element for an imager or display. Often the pixel is synonymous with a physical dimension of the imager or display element (*e.g.*, a single CCD element in an array, or a triad of phosphor elements in a color display). In other cases, the pixel size is adjustable by grouping or treating a number of individual imager or display elements as one. Embodiments of the Applicants' disclosed readers take advantage of each of these methods.

In particular, some embodiments of Applicants' disclosed reader may employ rows of optical sensors (*e.g.* CCD elements), where the optical sensors of at least one row each have a *physically* different height from the optical sensors of other rows. In such embodiments, rows of physically different heights are employed in successive passes. Additionally, or alternatively, the optical sensors of multiple rows can be combined to create a row of pixels having a first height (*e.g.*, a single row of optical sensors) and a second row of pixels having a second height (*e.g.*, two rows of optical sensors processed or treated as one). Other combinations are of course possible, as discussed in the specification and/or as will be apparent to those of skill in the art.

Joseph et al. (U.S. Patent No. 5,710,417) is generally directed to a reader comprising a window, a two dimensional CCD array, and programmable microprocessor. The microprocessor may be used to achieve a programmable pixel size. In particular, Joseph is cited as teaching “[t]he overall effect with respect to the CCD is to make the pixels appear as if they are very tall and can see several lines simultaneously” relying on Joseph at col. 7, line 61-col.8, line 4. Thus, Joseph teaches making more passes during a single integration period (*i.e.*, image capture period), which leads to the optical effect of the pixels *appearing* as if they are very tall. In this respect, Joseph does *not* actually change the height of the pixel (*i.e.*, smallest independently addressable element of resolution), but rather crowds more image on a fixed size pixel element, thus giving the *appearance* of being very tall. Thus, Joseph employs an optical trick to make the pixels appear very tall, without actually changing pixel height. In this respect, Joseph is incorrectly using the term “pixel” to refer to the amount of image that can be fit on an image sensor element, *rather* than referring to the actual physical image sensor element itself. Thus, Joseph fails to teach or suggest employing different actual pixel heights (*i.e.*, height of the smallest resolvable element). Further, the use of more than one pixel height while imaging a single barcode symbol is counterintuitive, and not disclosed or suggested by Joseph. Thus, Joseph fails to teach or suggest employing different pixel heights (*i.e.*, height of the smallest resolvable element) *between successive passes*.

Claim 1 recites, *inter alia*, “a scanning control circuit coupled to the two-dimensional sensor to selectively receive electrical signals from successive sets of the pixels along the rows in the scanning direction in at least a first and a second successive pass along the rows, where the sets of the pixels extend across at least one row in a direction perpendicular to

the scanning direction, and *each set of the pixels has a first height in the direction perpendicular to the scanning direction during the first pass and a second height in the direction perpendicular to the scanning direction during the second successive pass, the second height different from the first height.*" (Emphasis added.)

As discussed above, Joseph fails to disclose or suggest the use of different actual pixel heights. Joseph also fails to disclose or suggest modifying the pixel height between successive passes. Thus, Joseph fails to disclose or suggest the limitations of claim 1.

Claim 14 recites, *inter alia*, "receiving electrical signals from successive sets of the pixels along the rows in the scanning direction in at least a first pass along the rows, where the sets of the pixels extend across at least one row in the direction perpendicular to the scanning direction and each set of pixels has a first height in the direction perpendicular to the scanning direction during the first pass;" and" "receiving electrical signals from successive sets of the pixels along the rows in the scanning direction in at least a second pass along the rows, the second pass successively following the first pass, where the sets of the pixels extend across at least one row in the direction perpendicular to the scanning direction and *each set of pixels has a second height in the direction perpendicular to the scanning direction during the second pass, the second height different from the first height.*" (Emphasis added.)

As discussed above, Joseph fails to disclose or suggest the use of different actual pixel heights. Joseph also fails to disclose or suggest modifying the pixel height between successive passes. Thus, Joseph fails to disclose or suggest the limitations of claim 14.

Claim 27 recites, *inter alia*, "wherein, in order to acquire a code placed opposite the reading window, the sensor means are adapted to carry out *at least two scanning operations and to modify, between at least two successive scanning operations, the height Hy of the scanned portion of the two-dimensional sensor.*" (Emphasis added.)

As discussed above, Joseph fails to disclose or suggest the use of different actual pixel heights. Joseph also fails to disclose or suggest modifying the pixel height between successive passes. Thus, Joseph fails to disclose or suggest the limitations of claim 27.

Claim 31 recites, *inter alia*, "a process for acquiring bichromatic bar codes, wherein, in order to acquire a code placed opposite the reading window, *at least two scanning operations are carried out and, between at least two successive scanning operations, the height Hy of the scanned portion of the two-dimensional sensor is modified.*" (Emphasis added.)

As discussed above, Joseph fails to disclose or suggest the use of different actual pixel heights. Joseph also fails to disclose or suggest modifying the pixel height between successive passes. Thus, Joseph fails to disclose or suggest the limitations of claim 31.

Conclusion

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 1, 14, 27 and 31, and thus such claims are allowable. Because the remaining claims depend from allowable independent claims 1, 14, 27 and 31, and also because they include additional limitations, such claims are likewise allowable. If the undersigned attorney has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims are allowable. Applicants, therefore, respectfully request that the Examiner reconsider this application and timely allow all pending claims. Examiner Franklin is encouraged to contact Mr. Abramonte by telephone to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, she is encouraged to contact Mr. Abramonte by telephone to expediently correct such informalities.

Respectfully submitted,  
Jean-Louis Massieu et al.  
Seed Intellectual Property Law Group PLLC

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Frank Abramonte  
Registration No. 38,066

Enclosure:  
Postcard

701 Fifth Avenue, Suite 6300  
Seattle, Washington 98104-7092  
(206) 622-4900  
Fax: (206) 682-6031

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